River the stages were low during the first half but were comparatively high during the last half of the month. Navigation was interfered with to some extent.

Low stages prevailed in the upper White River during the month, but moderately high stages prevailed in the lower reaches of the White River.

The flood in the Ouachita River subsided slowly from a stage of 41.9 feet on June 1 to 31 feet on June 30.

No floods occurred in the Red River, and low stages prevailed, except that there were slight rises toward the close of the month.

The flood in the lower Mississippi River continued to subside, except that there was a rise of 5.9 feet at Memphis, from the 16th to 19th; 6.6 feet at Helena, from the 21st to 25th; 7.5 feet at Arkansas City, from the 22d to 27th; 3.1 feet at Vicksburg, from the 25th to 29th; and at Natchez 1.4 feet, from the 27th to the close of the month. Below Natchez the decline was continuous throughout the month.

ELECTRIC STORMS IN WESTERN KANSAS.

By S. D. FLORA, Observer, Weather Bureau.

The dry, windy weather that prevailed in western Kansas from the last decade of April until the close of the first decade of June, 1912, was accompanied by an unusual number of very peculiar atmospheric disturbances which for want of a better name are commonly designated as electric storms. These are distinct from thunderstorms or the disturbances of the magnetic needle during auroral displays. They occur at irregular intervals in practically all parts of Kansas west of the 101st meridian, and in the northern counties have been experienced with diminished intensity as far east as Phillips County, at the 99th meridian.

During these disturbances metallic objects that are insulated from the earth become highly electrified. Steel windmills, especially if mounted on wooden towers, become highly charged, and the first indication of one of these storms is usually an electric shock experienced in taking hold of the wire hanging down from a windmill for the purpose of turning it off. Sometimes a shock received in this way is almost sufficient to knock a person over. Barbed-wire fences and stoves also become charged sufficiently to give a severe shock to anyone touching them, and it is not uncommon for a housewife to have to cover the handle of cooking utensils with cloths to avoid the discomfort of the electric discharges.

One instance has been reported where a stovepipe passed through an iron roof in a small house and the discharge of electric sparks between the pipe and roof was practically continuous and their constant snapping was almost as loud as the clicking of a telegraph instrument. Another observer reports that sparks passing from a cookstove to a copper-bottomed wash boiler sitting near made a noise as loud as a match that suddenly ignites when stepped upon.

The nighttime effects of a severe storm of this kind are startling in the extreme to an inexperienced person. Numerous instances are reported where herds of cattle have been seen with "balls of fire as large as marbles" on their horns, and in one instance a ranchman in northwestern Kansas had the unique experience one night of driving cattle with this continuous electrical display from their horns and similar "balls of fire" which he describes as large as "the cork of an ink bottle" at the end of each ear of the mule he was riding, and also at the end of his riding whip.

Another observer reports an instance where the barbs of a wire fence were all ablaze with electric discharges one night. A wire thus charged came loose in the high wind and described an arc over the grass, killing all the vegetation it touched. In another instance reported the iron horse used as a counterweight on a windmill was seen to be ablaze with the electric glow.

These accounts strongly suggest the St. Elmo's fire sometimes seen on masts of ships or in a mountainous country during a fall of soft snow, but the disturbances in western Kansas are never associated with precipitation, and the air during their occurrence is usually dry even for that portion of the State where the annual precipitation is generally less than 20 inches, and drying winds are of common occurrence.

They usually occur in late spring or early summer when high winds and dust storms are most frequent, and are seldom, if ever, experienced in the winter time. Sometimes several years elapse with no disturbances of this kind even in the northwestern counties, where they are most severe.

The high winds which accompany these storms are usually from a northwesterly direction, although occasionally they occur with winds from the northeast or southwest. As they occur only during dry weather the air is usually filled with dust, but high winds and dust storms often occur in this part of the State without any electrical phenomena being noticed.

They seem to occur in streaks varying from a few feet to several miles in width and usually do not last more than a few hours, though there have been instances where storms of this kind have extended over several days, the electrical phenomena disappearing as the wind diminished during the night and reappearing when it increased the next day.

Beyond a depressing effect, with a tendency to headache, and the discomfort of the electric discharges when metallic objects are touched, these storms seem to have no effect on persons, but after the occurrence of a severe storm of this kind crops often show effects similar to those of a killing frost. The leaves of trees and other foliage roll up and drop off and in many instances fields of corn and wheat are killed entirely. At Goodland, Kans., the leaves of the trees were destroyed twice in one spring by these storms, a sufficient time having elapsed between the first and second storm for a new set of leaves to grow.

Whether these disastrous effects to crops are due to the electrical condition of the air or to the dry winds that always blow during electric storms is an unsettled question. Many settlers in western Kansas who have had from 20 to 30 years' experience, and hence ample opportunity to compare the effect of these storms and drying winds when there were no electrical phenomena, are firmly of the opinion that the damage to crops is caused by the excessive accumulation and discharge of electricity.

The data collected thus far are of such general nature as to leave in doubt not only this point but the probable cause of these phenomena.

In western Kansas it is commonly believed that the electrical disturbance is due to the friction of the dust particles in the air from the high wind blowing, but as pointed out by Prof. Cleveland Abbe in the Monthly Weather Review of May, 1898, there may be other and more plausible explanations.

Whether there is a similarity between the cause of these storms and the discharge of electricity known as St. Elmo's fire and to what extent these disturbances occur in other Western States are interesting questions that will require future investigation.

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